



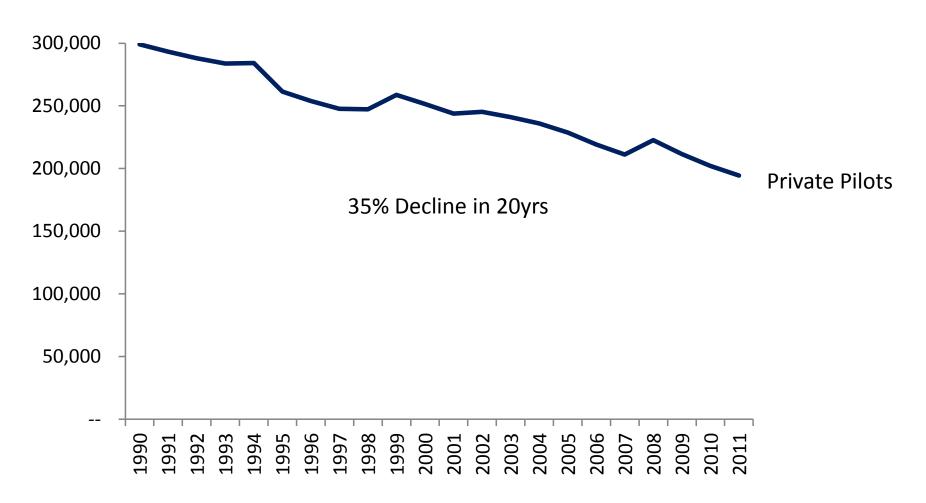
### 2 Topics / 5 minutes

LSA & SPL are vital to the future of General Aviation (GA)

Key Safety Innovation: Spin Resistant Airframe (SRA)



### Problem: Light GA is declining



Source: 2011 GAMA Statistical Databook & Industry Outlook



#### 2 Dramatic Regulatory Changes can Revitalize GA



- 1. Light Sport Aircraft (LSA)
- 2. Sport Pilot License (SPL)



# LSA can Revitalize GA & Improve Safety

- ATSM Compliance Statement vs FAA Certification to 14CFR§23
  - = Increased degrees of freedoms
  - = Increased innovation rate
  - = safer better products
  - = lower costs to consumers
  - = higher adoption rates
  - = healthier industries
  - = MORE SAFETY INNOVATIONS







# ICON A5 – Light Sport Aircraft



Seats: 2

Speed: 120 mph

Range: 350 miles (3 hrs flight)

Takeoff: 750 feet

Fuel: Auto or Aviation

Runway: Airport, Grass, Waterway







# Spin Resistant Airframe (SRA) vs Spin Recoverable

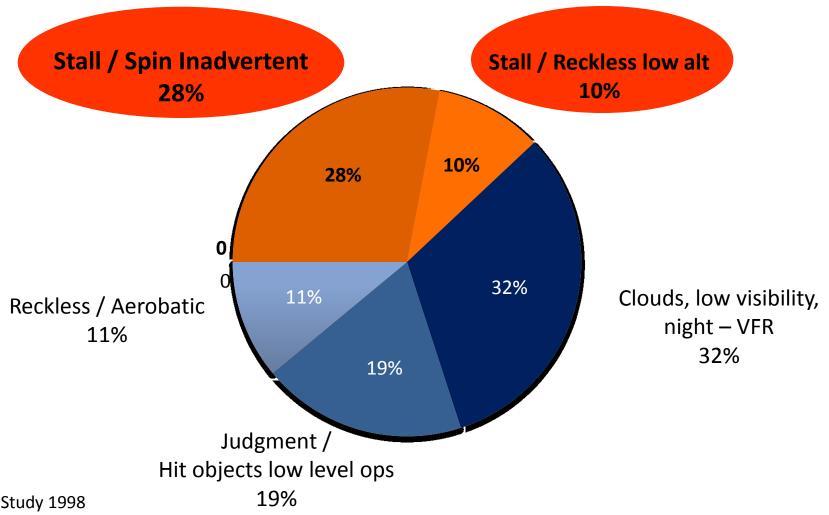


What is a Spin?

SPIN = LOSS OF AIRCRAFT CONTROL



#### U.S. Top 5 Fixed Gear Fatal Accident Causes



FAA SAT Study 1998



# Why Spin Resistant vs Spin Recoverable?

- 1. 41% GA fatalities due to inadvertent Stall/Spins
- 2. Spin recovery is advanced competency no longer taught
- 3. LSA = lower altitude / lower speed
- 4. SPL = entry level pilots

**Bottom-line:** The right thing to do for safety

Analogous to anti-lock brakes for cars



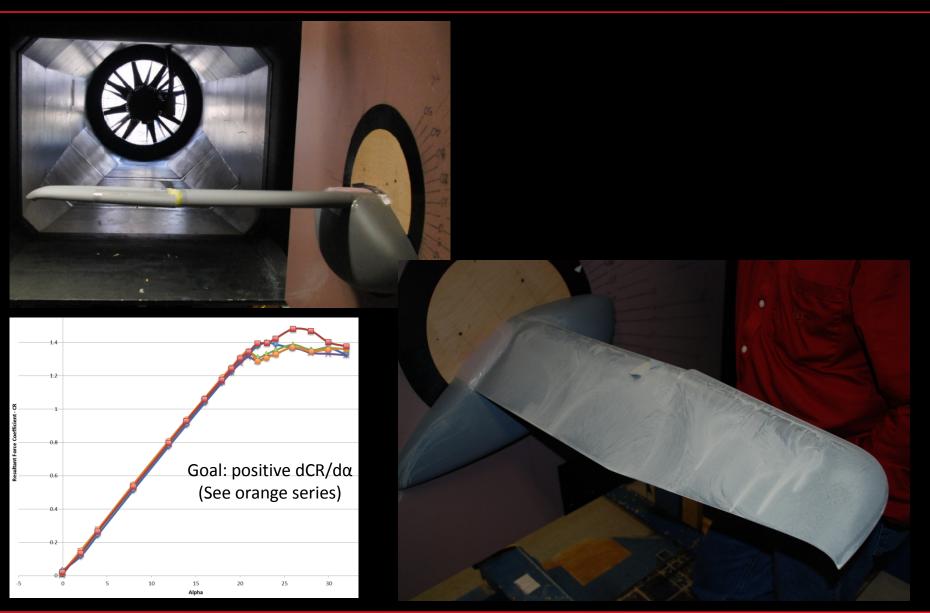
# Characteristics of a Spin Resistance Airframe

- 1. Spin Resistant
- 2. Controllable in a Stall
- 3. Slow descent rate (1000 fpm)











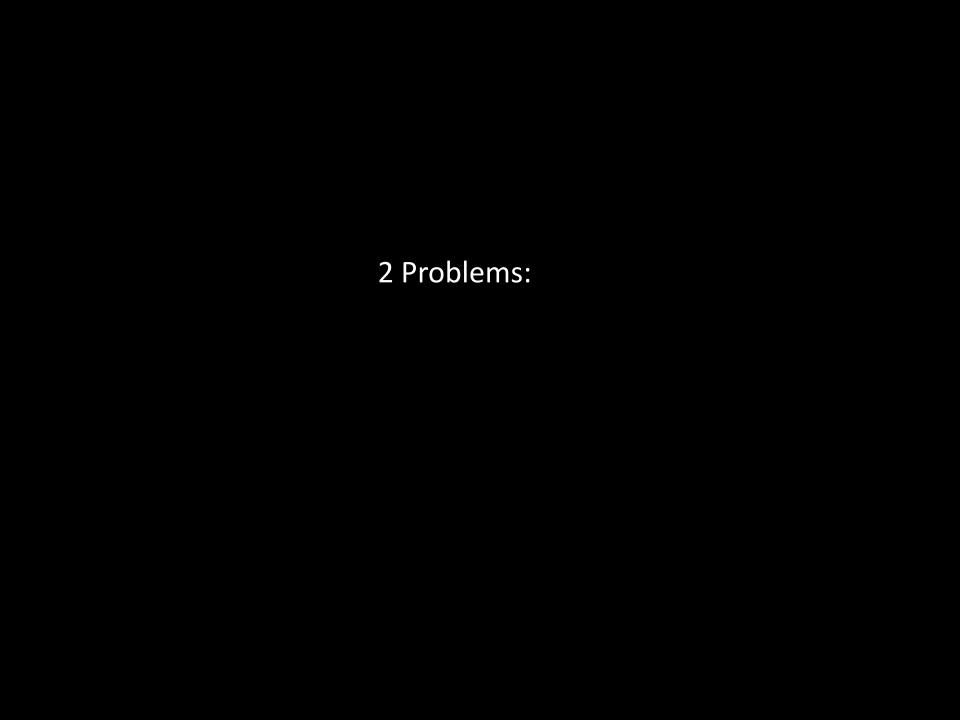
# Full Envelope FAR 23 Spin Resistant Airframe



Video 1: Spin Resistant

Video 2: Controllable in a Stall

Video 3: Slow Descent During Stall



NO FREE LUNCH: SRA = MORE WEIGHT

LSA IS ALREADY TOO LIGHT



#### Summary

- 1. GA needs LSA & SPL
- 2. LSA & SPL need Spin Resistant Airframes (SRA)
- 3. LSA needs weight to enable safety innovations like SRA



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# Appendices







CAP Deployments by Reason

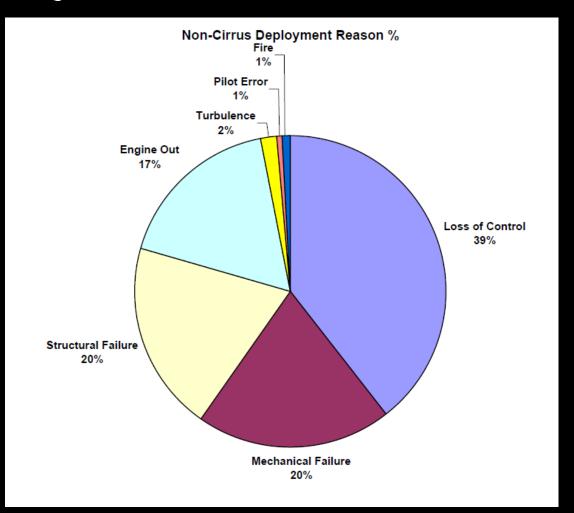
(BRS non-cirrus data)

<b>- -</b>	C +	399	1/
_oss of	Contro	74	<b>%</b>
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Mechanical Failure 20%

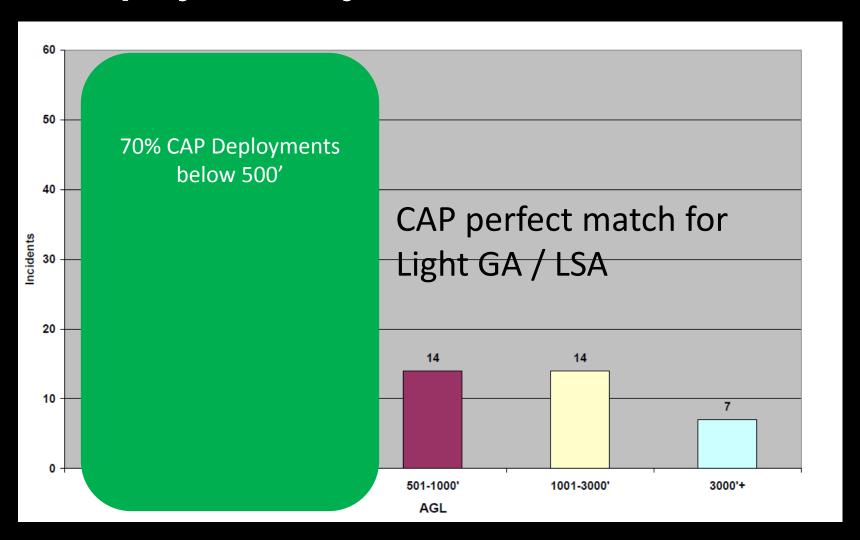
Structural Failure 20%

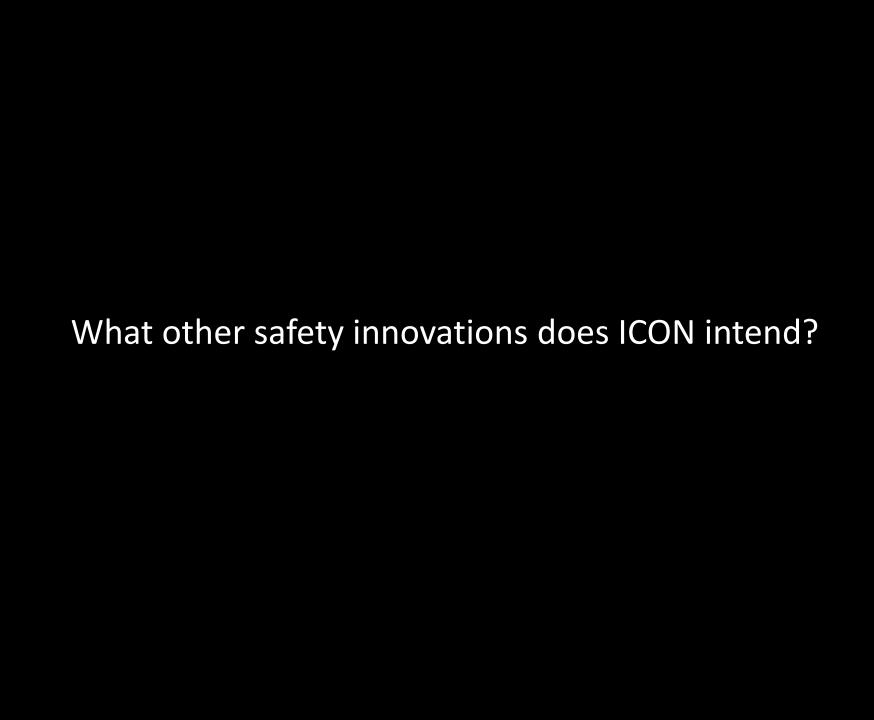
Engine Out 17%





# CAP Deployments by AGL (BRS non-cirrus data)















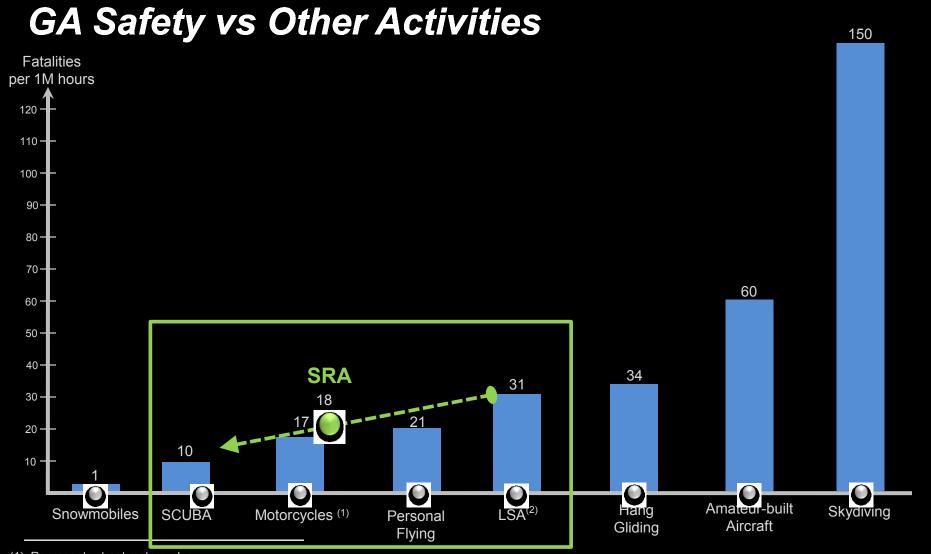












<sup>(1)</sup> Represents street motorcycles.

<sup>(2)</sup> Represents S-LSA.only

<sup>(3)</sup> Assumes: no in-flight break-ups, 85% reduction stall/spins (spin resistance), 50% reduction fuel starvation & CAP preventables, 5 x CFITs, no credit for inflatable restraints

Why is LSA too light?



e Model	Seats	HP	Max Speed	Cruise Speed				
			(kts)	(kts)	Stall Speed (Vs kts)	Empty Weight (lbs)		Useful Load (lbs)
na C-152	2	110	110	107	43	1,081		589
r PA-38	2	112	109	100	49	1,128		542
ond DA-20	2	125	138	118	42	1,166		598
ty XL2	2	125	122	113	50	1,160		590
nman AA-1	2	108	120	110	53	1,018		482
hcraft Skipper	2	115	119	105	47	1,100		575
Averages	2	116	120	109	47	1,109		563
Airplane (Land)	2	NA	120		45			
Land LSA Weight Defficiency								
	ond DA-20 ty XL2 nman AA-1 hcraft Skipper	PA-38 2  Ond DA-20 2  ty XL2 2  Imman AA-1 2  Averages 2	PA-38 2 112  ond DA-20 2 125  ty XL2 2 125  man AA-1 2 108  hcraft Skipper 2 115  Averages 2 116	PA-38 2 112 109  ond DA-20 2 125 138  ty XL2 2 125 122  nman AA-1 2 108 120  hcraft Skipper 2 115 119  Averages 2 116 120	PA-38 2 112 109 100  ond DA-20 2 125 138 118  ty XL2 2 125 122 113  nman AA-1 2 108 120 110  hcraft Skipper 2 115 119 105  Averages 2 116 120 109	PA-38 2 112 109 100 49  ond DA-20 2 125 138 118 42  ty XL2 2 125 122 113 50  man AA-1 2 108 120 110 53  hcraft Skipper 2 115 119 105 47  Averages 2 116 120 109 47	PA-38 2 112 109 100 49 1,128  ond DA-20 2 125 138 118 42 1,166  ty XL2 2 125 122 113 50 1,160  man AA-1 2 108 120 110 53 1,018  hcraft Skipper 2 115 119 105 47 1,100  Averages 2 116 120 109 47 1,109	PA-38 2 112 109 100 49 1,128  ond DA-20 2 125 138 118 42 1,166  tty XL2 2 125 122 113 50 1,160  nman AA-1 2 108 120 110 53 1,018  hcraft Skipper 2 115 119 105 47 1,100  Averages 2 116 120 109 47 1,109  skirplane (Land) 2 NA 120 45







What's the role of flight training?













What changed with LSA?

How does it fit into GA?



# Personal Flying Safer + More Accessible

### 1. Light Sport Aircraft

2 persons

140 mph max

1320 lbs

One engine

ASTM vs P23

Regulated similar to autos

Price = premium car

### 2. Sport Pilot License

20 hours training

Day only

Good weather

Below 10,000' MSL

Cost = \$4000

Time = 2 Weeks

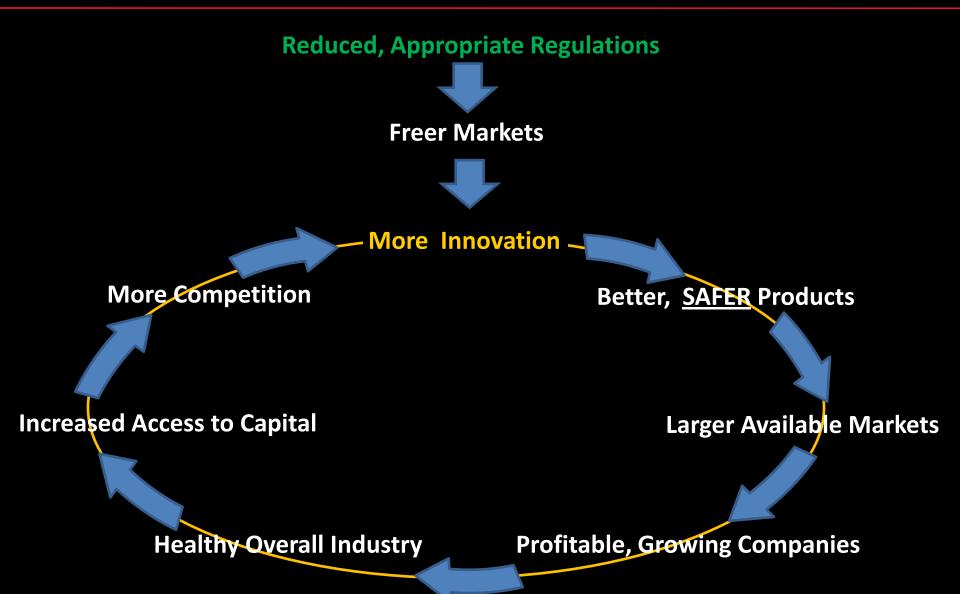


#### **Effore** LSA Rules Market for New Aircraft **Business Jets** Gulfstream / Cessna / Bombardier \$3M+ Cessna / Embraer Very Light Jets \$1M Price per aircraft **Light Twins Beechcraft** \$500K Light Single Engines Cirrus Transportation / Utility \$200K \$150K Nothing Available New Light Sport \$75K \$50K

Ultralights (254lbs max by law)



## Cycle of Regulatory Reduction and Industry Growth







# Additional Discussion Topics

- 1. Talk more on SRA's controllability in a stall? (1' video)
- 2. Talk more on SRA's slow descent rate? (1' video)
- 3. What's your opinion on CAP for LSA? (2 x CAP slides)
- 4. What other safety features might ICON include? (6 x slides)
  - 1. Intuitive cockpit architecture
  - 2. Angle of Attack Gage (AoA)
  - 3. Crashworthy interior
  - 4. Flight Data Recorder (FDR)
- 5. Why say LSA too light? (slide on 2 seat planes)
- 6. What role does flight training play? (3 x slides)
- 7. Elaborate on what exactly changed with LSA/SPL? (1 x slide)